

Remarks/Arguments

No amendments have been made to the pending claims.

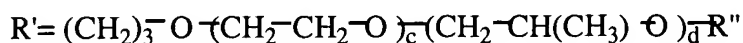
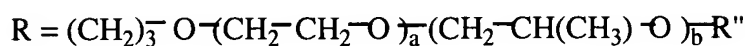
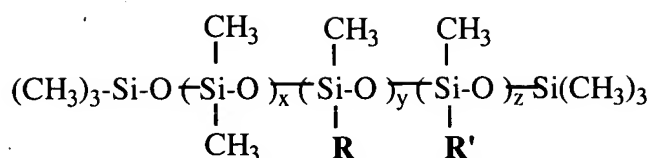
The present invention provides a silicone surfactant (polyether-polysiloxane copolymer) for stabilizing the cell formation in the preparation of rigid polyurethane and/or polyisocyanurate foam blown with C4 and/or C5 hydrocarbon (HC) blowing agents, the silicone surfactant comprising a polyether-polysiloxane copolymer represented by the formula shown in the pending claims. The copolymer formula defines one pendant polyether side chain.

Use of the defined silicone surfactants in the production of rigid polyurethane foams using a C4 and/or C5 hydrocarbon blowing agent provides one or more of the following advantages as manifested in the Examples:

- Foams with improved performance properties in appliance applications,
- Improvement in thermal insulation,
- Improvement in minimum fill properties that relate to a reduction in density,
- Reduction in voiding which relates to how well the foam fills the mold without excessively large air pockets just below the surface of the foam,
- Enhanced surfactant compatibility in the polyol resulting in a decreased tendency for the hydrocarbon blowing agent to separate after aging.

Claims 1-22 were rejected under 103a as being anticipated by Chojnacki (US 5,883,142). Applicants submitted that Chojnacki neither anticipates nor renders obvious the subject matter as a whole defined by the pending claims. Chojnacki is deficient with respect to teaching or suggesting the preparation of C4-C5 HC-blown rigid polyurethane foams using a silicone surfactant comprising a polyether-polysiloxane copolymer of the formula in Applicants' pending claims.

Chojnacki's polyether-polysiloxane copolymer has the following formula



where R'' is H, CH₃, or C(O)CH₃; x is 50 - 200; y+z is 3 - 30; and x/(y+z) is 7 - 20; the total surfactant molecular weight is 12,000 - 100,000 g/mole, the wt% siloxane in the surfactant is 10 - 40 wt%, the blend average molecular weight of the polyether portion is 1200 - 6000 g/mole, and the wt% of ethylene oxide in the polyether portion is 30 - 100 wt%. The Examiner should note that Chojnacki's copolymer contains two different polyether side chains, namely R and R', a very significant structural difference from the copolymers of Applicants' claims. There no teaching, direction or motivation whatsoever in Chojnacki to remove one of the pendant polyether groups to afford a silicone copolymer like Applicants' copolymer. Chojnacki's silicone surfactants are made by the simultaneous reaction of the siloxane backbone with the allyl terminated R and R' polyethers, with the R and R' polyethers in a specifically chosen ratio; whereas Applicants' surfactants are made by omitting the incorporation of a second polyether side chain.

Furthermore, while the silicone surfactant formula of Chojnacki and that of the pending claims may have overlap in certain parameters, the blend average molecular weight (BAMW) of the polyether portion in Chojnacki's surfactants is 1200-6000 g/mole whereas in the present claims the BAMW is 450-1000 g/m. The use of the terminology "BAMW" was for consistency with this prior art but in no way was intended to imply the presence of two different polyether side chains. In the present invention the BAMW is the same as the molecular weight (MW) of the polyether group itself.

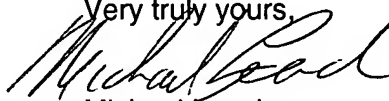
Examples 3 and 4 in Chojnacki's Table 2, demonstrate that structures with polyether pendant BAMWs in the 550-750 range performed significantly worse as cell structure regulators when compared to the range of 1200-6000 for the silicone surfactants in

Chojnacki's HFC and HCFC blown foams. Since Chojnacki is not directed toward HC blowing agents, it can provide no direction or motivation to a worker of ordinary skill in the art that moving to the non-preferred BAMW range and removing one of the polyether side chains would improve performance with HC blowing agents. Moreover, the examples in Applicants' specification shows the advantages achieved using Applicants' defined silicone surfactants and C4 and/or C5 HC-blown rigid polyurethane compositions.

Accordingly, Applicants submit that Chojnacki also does not render obvious the claimed subject matter as a whole defined by Applicants' pending claims. Since a 103a rejection has not been made out by the Examiner, a discussion of the scope of the showing of unexpected results is not warranted. Applicants request reconsideration of this rejection and its withdrawal.

Believing the case is in condition for allowance Applicants solicit an action to that effect.

Very truly yours,



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